

# Detecting and Eliminating Illicit Discharges

Presented  
to

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EPA MS4 Operators  
Conference

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# **Background of Houston's MS4 Permit**

- A single MS4 Permit is shared by four co-permittees
- Each agency is responsible for implementing its own SWMP
- The five year permit became effective on October 1, 1998
  - Years 1-3 Major Program Development
  - Years 4-5 Major Program Implementation

# **MS4 Permit Requirements for Illicit Discharges**

- The City's MS4 Permit requires a variety of programs to address illicit discharges and improper disposal:
  - Floatables program
  - HHW program
  - Sanitary sewer inflow program
  - Program to locate and eliminate illicit discharges and improper disposal to MS4

# **Illicit Discharge Detection and Elimination Program**

- City ordinance prohibits discharge of non-storm water to MS4 (Sec. 47-741)
  - Affirmative defense allowed for certain discharges (e.g., TPDES authorized discharge, lawn watering)
- State law prohibits discharges that cause or will cause pollution (TWC Sec. 21.121)

# **Identification of Possible Illicit Discharges**

- High monitoring/screening results
- Complaints

# Monitoring & Screening Programs

- Representative Monitoring
  - 4 sites, 3 times a year
- Dry Weather Screening
  - Approx. 20 % of major outfalls/year
- Wet Weather Screening
  - 10% of dry weather screening sites
  - 100% of area served by the MS4 (though not all outfalls)

# Action Levels

- Action levels were developed to evaluate questionable discharges identified by the City's field screening program
- Levels are based on national research from government sources
- Two levels
  - Elevated
  - Severe

# Action Levels

<u>Parameter</u>	<u>Elevated</u>	<u>Severe</u>
Fecal Coliform	200 cfu/100 mL	>100,000 cfu/100 mL
Ammonia	>2.0 mg/L	>8.0 mg/L
Copper	>0.65 mg/L	>1.3 mg/L
pH	<6 or >9	<5 or >10.5
Phenols	>0.3 mg/L	>1.20 mg/L
Chlorine	>0.5 mg/L	>10.0 mg/L
Detergent	>4 mg/L	>4 and evaluated with other parameters



# Response to Screening Results

## Elevated

- Referred to Health Department for investigation
- If initial investigation indicates that an extensive investigation is required, possibly referred to City contractor

## Severe

- Immediately referred to City contractor
- If necessary, environmental containment and cleanup initiated

# **Public Reporting of Potential Illicit Discharges**

Complaints can be received several  
ways:

- 311 Program
- Health Dept.'s Hotline
- TCEQ/EPA

# **Response to Complaints**

- Health Department
- Public Works and Engineering Department
- Police Department

# **Complaint Investigations in Most Recent Annual Report**

- 1989 complaints of dumping of solid/hazardous waste investigated
- 107 complaints of used motor oil investigated
- 500 complaints of water pollution/illicit discharges investigated

# Enforcement Mechanisms

- Notices of Violation
- Municipal Court Citations
  - Fines between \$250 and \$2000
- Civil lawsuits for injunction and recovery of damages
- Referral to District Attorney for violations of TWC
- Suspension of utility service and MS4 access

# Extended Investigations

- Ongoing/repeat discharges
- No readily-identifiable source
- Example: Brays Bayou Representative Monitoring Site

# Brays Bayou Investigation

- Samples of discharges from another co-permittee's representative monitoring site exhibited high concentrations of fecal coliform, streptococci and enterococci
- Because of the possibility that the storm sewers in the area were interconnected, the City was concerned that the high bacterial levels could have come from a sanitary sewer overflow (SSO) from the City's sanitary sewer system

# Brays Bayou Investigation

- Houston initiated an investigation to determine if SSOs or illicit connections were involved
- A windshield survey was performed for the drainage area to rule out obvious sources
- Historic drawings for the storm sewer system were located



# Brays Bayou Investigation

- The City's contractor conducted a field investigation to determine whether the City's storm sewer system was cross-connected with the other agency's storm sewer system
- The field investigation also included locating City sanitary sewers in the area to determine the proximity of the City sanitary sewers to the other agency's storm sewer system

# Results of the Field Investigation

- No evidence of a City sanitary sewer connecting to the other agency's storm sewer system
- One possible connection of City storm sewer to the other agency's storm sewer significantly upstream of where the high bacteria levels were found
- No evidence of a SSO

# Brays Bayou Investigation Sampling

- After the field investigation, wet weather sampling was conducted at 7 locations along the other agency's storm sewer to pinpoint where the bacteria discharged into that system
- A second set of samples was collected one hour and 20 minutes later
- Sample parameters: ammonia and fecal coliform

# Sampling Results

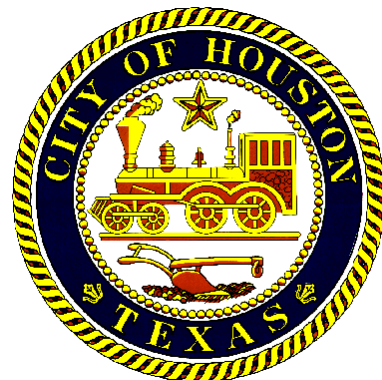
- The first sampling data set indicated high levels of fecal coliform at the three sites in the downstream portion of the storm sewer
- The second sampling data set also had high readings at two of those three sites
- The four upstream sites had significantly lower levels of fecal coliform both times

# Other Possible Sources

- While conducting this investigation, the contractor observed a considerable number of pigeons under an overpass where the other co-permittee's road crosses a City street
- This area drains into the portion of the storm sewer where the high bacteria levels were found
- The current plan is to conduct additional sampling at specified inlets and manholes to directly pinpoint the source(s) of the bacteria

# Closing Points

- Importance of coordination among City departments, divisions and contractors
- Importance of coordination among co-permittees
- Not all sources of pollutants are easily identifiable



# **Houston's Illicit Discharge Detection and Elimination Program**

